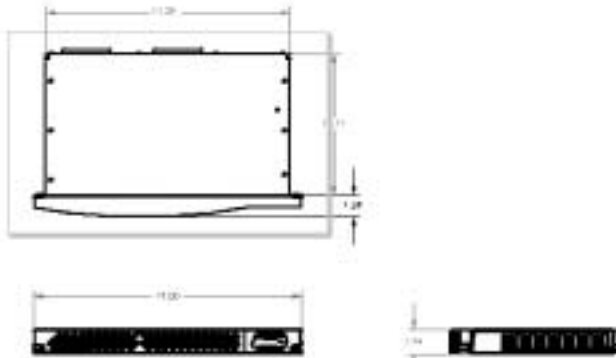


10-712

# SAGEON™ POWER SYSTEM 48V/50A RECTIFIER

For telecommunications applications



## MECHANICAL

### Size:

Width: .....19.0 in (483 mm)  
Height: .....1.74 in (43.7 mm) (1RU)  
Depth: .....12.0 in (305 mm)  
Mass: .....12.3 lbs (5.58 kg)

### Mounting Hardware:

The Sageon mounting hardware accommodates one rectifier in 1RU of rack height in a standard 19 or 23 inch rack. The hardware fits a rack 11.8 in (300 mm) or greater in depth.

## CONNECTIONS

### Input, Output, and Communications:

Three connectors are mounted on the rear of the rectifier module; matching connectors are located at the face of the mounting hardware; mating of connectors occurs when the rectifier is installed into the mounting hardware.

<sup>1</sup> The unit can operate from 90V to 290V, but has the RATED voltage range and tolerance as specified. Specifications apply to 230VAC.

The Sageon™ 48V/50A is a switched mode rectifier (rectifier) module designed to provide up to 58A of output current into a 48V nominal system. This rectifier has been designed to be used in conjunction with a battery to provide an uninterruptible DC power system. The low noise and high reliability make it ideally suited to telecommunications applications. From 1 to 225 rectifiers can be configured as a system using one control and supervisory unit (Sageon Plant Controller). The system can be monitored and controlled remotely using SageView™ software.

Operating characteristics of the Sageon 48V/50A rectifier at 77F (25C) ambient, 230VAC unless otherwise stated.

## INPUT

### Voltage:

Single phase: . . . . .Phase to Phase or Phase to Neutral  
Rated Voltage Range: . . . . .208 – 240VAC  
Rated voltage tolerance<sup>1</sup>: . . . . .180 – 275VAC  
Extended low voltage tolerance<sup>1</sup>: . . . . .90 – 180VAC  
(With power limit increasing from . . . . .50% – 100%)  
Extended high voltage tolerance<sup>1</sup>: . . . . .275 – 290VAC  
Must start voltage: . . . . .90VAC  
Fully protected up to 440VAC

### Current:

18A RMS max at 180VAC  
14A RMS at 220VAC

**Frequency:** 50 / 60Hz ± 10%

**Power Factor:** > 0.98 at 40% to 100% load

### Harmonic Distortion:

Current THD < 5%, typically at full load when operated with mains voltage THD < 1%

**Efficiency:** Better than 90% at > 50% load at 230VAC

**Inrush Current:** < 8A peak at nominal input voltage

**Soft Start:** Ramp-up time 8 seconds to full load

### Protection:

AC input fuse on both lines Overvoltage shutdown at approx. 300VAC Undervoltage shutdown at approx. 85VAC Input soft start – can be connected to live AC bus Indefinite survival at 440VAC (for accidental phase to phase connection or neutral loss)

### Voltage Withstand Test:

1500VAC input to chassis for 1 minute

### Conversion Frequency:

140kHz for input stage  
180kHz for output stage



## ALARMS AND MONITORING

### Front Panel LED Condition Table:

Green	Yellow	Red	Condition
0	0	0	Primary power off
F*	0	0	Primary power bad
1	0	0	Normal
1	F*	0	Alarm
1	1	0	Equalize
0	F*	1	Shutdown
0	0	1	µP fault

Note: F\* indicates flashing LED.

#### Primary Power Bad:

Indicates that the input AC is too low or too high, or that the primary circuit is faulty.

#### Normal:

Status is normal.

#### Alarm:

See Alarm table.

#### Equalize:

rectifier is in equalize mode.

#### Shutdown:

rectifier is shut down by remote control, or there is an internal fault in the rectifier, such as control loop out of limit or temperature sensor faulty.

#### µP fault:

Internal micro-controller is faulty.

#### Rectifier Status Monitoring:

Sageon Controller and SageView monitor status of the rectifier:

- Output current
- Heatsink temperature
- Software version

#### Current:

Monitored on Sageon Controller and SageView with 1A resolution; Analog measurement accuracy  $\pm 1\%$  at full load.

#### Voltage:

System voltage normally displayed on Sageon Controller alpha-numeric LCD display.

Accuracy  $\pm 0.5\%$ .

#### Rectifier Address:

The rectifier address is automatically set by a dip switches on the hardware.

#### Rectifier Alarm Monitoring:

The Alarm table shows alarm conditions that are monitored by the rectifier and are displayed on both Sageon Controller and SageView. The mnemonics listed here appear on SageView, but full alarm description appears on Sageon Controller.

### Alarm Table:

Vh *	Output voltage too high
VI *	Output voltage too low
Il *	Unit is in current limit
Po *	Unit is in power limit
Th *	Heatsink temperature high and thermal limit is active
Nd *	No demand (output terminal voltage higher than internal regulation value)
Lo *	Load current low (less than 0.9A)
Ma *	Operating parameters out of allowable range (or eeprom fault)
Sd	Unit is shut down by remote command - user shutdown
Mr	Internal voltage reference faulty
Mc	rectifier communication fault (Generated within Sageon controller)
Vs	High voltage shut down (output), latched alarm. User setting or fault
Unit Off	Unit is shut down due to AC out of range or rectifier primary circuit fault (normal operation or fault)
Ts	Temperature sensor fault
Dc	DC-DC feedback fault, latched alarm
Ff	Fan failure or inadequate air flow

Note: \* indicates flashing of alarm led on rectifier.

## ENVIRONMENTAL

#### Cooling:

Forced convection cooling using four 40 mm fans mounted internally with variable speed temperature control. Fan stops if AC power fails or rectifier inhibited remotely.

#### Temperature:

Operating range: ..... -13F (-25C) to 122F (50C)

Storage: ..... -4F (-20C) to 140F (60C)

The rectifier senses its internal heat-sink temperature and, if necessary, adjusts power limit and current limit to protect itself against over-heating.

**Humidity:** 0 to 90% non-condensing

**Altitude:** Operational to 10,000 ft (3,000 m) (Consult factory above this)

#### Vibration:

Operational: 2-9Hz, 0.06 in (1.5 mm) displacement, all major axes  
9-200Hz, 0.5g, all major axes

Transport: 5-20Hz, 0.01g/Hz<sup>2</sup> acceleration, 20-200Hz -3dB/oct all major axes

#### Shock:

Packaged: 18g 6ms half sine, all major axes

#### Drop test:

Packaged: 39.37 in (1 m) drop all faces

#### Acoustic Noise (A Weighted):

< 45dB (80% load, 77F (25C) ambient)

< 50dB (100% load, 77F (25C) ambient)

< 55dB (100% load, 122F (50C) ambient)

## COMPLIANCES

### Safety:

IEC60950:1999; EN60950; AS/NZS 60950:2000;  
UL60950: 2000

### EMC Emissions and Immunity:

ETSI EN 300 386 V1.3.1 (2001- 09)

### Environmental:

ETSI EN 300 019

## EMC TEST LEVELS

### Emissions:

Category:	Tested to:	
Harmonics	IEC 61000-3-2; EN61000-3-2*; AS/NZS 61000-3-2*:	Class A
Conducted RF – AC port	CISPR 22 (1997); EN55022 (1998)*; AS/NZS 3548 (1997)*:	Class B
Conducted RF – DC port	CISPR 22 (1997):	Class A
Radiated RF	CISPR 22 (1997); EN55022 (1998)*; AS/NZS 3548 (1997)*:	Class B

\* Indicates that the standard is equivalent to first standard named in the section.

### Immunity

Category:	Tested to:	
Electrostatic Discharge (ESD)	IEC 61000-4-2; EN61000-4-2*: (Air 8kV, Contact 6kV)	Criterion A
Radiated RF	IEC 61000-4-3; EN61000-4-3*: (10V/m, 80 – 1000MHz, 1kHz 80% AM) (10V/m, 1-2GHz, 1kHz 80% AM)	Criterion A
Electrical Fast Transient (EFT)	IEC 61000-4-4; EN61000-4-4*: (1kV on AC lines) (1kV on DC lines) (0.5kV on signal lines - indoor)	Criterion A Criterion A
Surge Protection	ANSI C62.41-1991 category B3 - AC lines (Combination Wave 6kV/3kA; Ring Wave 6kV/500A)  IEC 61000-4-5; EN61000-4-5* (Impulse) (6kV/3kA Common Mode [CM] on AC lines) (6kV/3kA Differential Mode [DM] on AC lines) (0.5kV/0.25kA CM & DM on DC lines)  IEC 61000-4-12; EN61000-4-12* (Ring Wave) (6kV/500A, 100kHz CM & DM on AC lines) (2kV CM, 1kV DM on DC lines)	Criterion A Criterion B Criterion A  Criterion A Criterion A
Conducted RF	IEC 61000-4-6; EN61000-4-6*: (3V on AC, load and comms lines)	Criterion A
Voltage Dip, Interruptions	IEC 61000-4-11; EN61000-4-11*: (Level: 100% dip for 10ms) (Level: 30% dip for 500ms) (Level: 100% dropout for 5s)	Criterion B Criterion A Criterion B

\* Indicates that the standard is equivalent to first standard named in the section.



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